DEPARTMENT OF DEFENSE

Application of the DoD Enterprise Architecture to the Process for Developing DoD Business Cases

Management Report

DoD Enterprise Architecture Congruence Community of Practice
By
Roy Mabry

Department of Defense
Office of the Chief Information Officer
Architecture & Interoperability Directorate

December 3, 2004

Edited, Summer 2005

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Executive Summary

The DoD Enterprise Architecture Congruence Community of Practice (DoD EAC CoP) has developed the DoD Enterprise Architecture (EA) for purposes of aligning it with the Federal Enterprise Architecture (FEA), and institutionalizing its use to inform the major decision processes of the Department, particularly the resources allocation part of the Capital Planning and Investment Control (CPIC) process for information technology (IT) initiatives (IT 300 Exhibits). Both the FEA and the DoD EA consist of five reference models: the Business Reference Model (BRM), the Service Component Reference Model (SRM), the Technical Reference Model (TRM), the Data Reference Model (DRM), and the Performance Reference Model (PRM). The DoD EAC CoP actions support DoD transformation goals including interoperability, net-centricity, and effective resource utilization by leveraging the DoD EA with the objective of electronically cataloguing and indexing the Department's IT initiatives and assets according to a common framework for categorizing enterprise information and making the knowledge fully accessible to the Department's management decision processes.

The National Defense mission is extremely complex and challenging, particularly in light of transformation goals of the Department. To most efficiently and effectively fulfill any element of the mission, DoD stakeholders must know about related and applicable activities, resources, capabilities, organizations, knowledge bases, policies, processes and standards. Establishing one-to-one relationships between all of these knowledge points directly is impossible yet is very achievable when done indirectly through a standardized DoD EA as represented by the set of reference models that capitalize on a publish and subscribe, service oriented architecture.

The DoD EA must include a number of standardized dimensions in order to enable rapid discovery based on different focus or area of interest. These dimensions provide the essence of the architectural perspectives required to achieve the overarching DoD vision of Net-Centric Operations and Warfare (NCOW) across the many, diverse Department communities. When consistently institutionalized and applied across the Department, the DoD EA can be a mechanism that profoundly increases vital information sharing within the Department. Just as the Dewey Decimal indexing and classification system has made knowledge accessible in libraries across the world, so can the development and widespread use of the standardized dimensions of the DoD EA. The DoD EA substantially increases cohesion and alignment of resources across DoD.

In the following pages, the report discusses the analysis of the IT300 Exhibits preparation process and provides recommendations for using the DoD EA during the process. Significant recommendations include:

- Changes to the ITMA time line to accommodate EA information

- Changes to the ITMA software to facilitate EA data quality checks before submitting IT 300 Exhibits to OMB
- Use DoD EA information to facilitate decisions in the portfolio management process
- Educate and train service and agency's resource management staff and architects to make more accurate use of EA information
- Use the DoD EA for analysis in the portfolio management process to include cross mission area analysis of IT investments

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Acknowledgements

This paper is the culmination of many hours of discussions and communications between and among members of the DoD Enterprise Architecture Community of Practice and the NII Resource Management Directorate. Special thanks goes to Mark Baehre, AF-CIO/A, MITRE; K. C. Yu, BMMP, IBM; Robert S Lewis, SECNAV, BAH; Lynn Fahnestock, J4, SRA; Marilee Cunningham, IDA; Norm Minekime, BMMP, CSC; Phil Homan, BMMP, IBM; Robert E. Damashek, CIO/G-6, Binary Systems; and Bonnie Hammersley, NII Resources Directorate.

Also much thanks goes to members of the Architecture and Infrastructure Committee of the U.S. CIO Council and those at the FEAPMO who have contributed intellectual content to this document with discussions about using the reference model approach to gain efficiency and improve effectiveness government-wide. A special thanks goes to Bob Haycock, former Chief Architect, OMB, FEAPMO; John McManus, CTO and Deputy CIO, NASA; Michael Farber, Principal, Booz Allen & Hamilton; and Angela Duin, Associate, Booz Allen & Hamilton.

Without the stimulating discussion and communications with all of these and others this report would not have been possible. It is offered within the context of improving efficiency and effectiveness in the Department through the use of new concepts and innovations in enterprise architecture.

Application of the DoD Enterprise Architecture to the Process for Developing DoD Business Cases

Introduction

The DoD Enterprise Architecture Congruence Community of Practice (DoD EAC CoP) was charged by the Services and the Business Management Modernization Program (BMMP) to align DoD enterprise architecture information with the Federal Enterprise Architecture (FEA), and institutionalize its use to inform the major decision processes of the Department, one of which is the Capital Planning and Investment Control Process. Under this charge, the DoD EAC CoP developed the DoD Enterprise Architecture (EA).

As the FEA represents the enterprise architecture for government, so then does the DoD EA represent the enterprise architecture for DoD. Also, as the FEA consists of a set of reference models (RMs), so then does the DoD EA. For that matter, the DoD EA takes the FEA RMs as a given and uses them as a target for aligning DoD Lines-of- Business (LOB), service-components, information technology (IT), and data and performance management information. Furthermore, as the FEA improves the capital planning process for IT and improves the efficiency and effectiveness of the government by improving the management of IT, and improves the alignment of IT with the strategic outcomes of the government, so then does the DoD EA improve the efficiency and effectiveness of the DoD by improving the management of IT and improving the alignment of IT with the strategic outcomes of the DoD.

The Office of Management and Budget (OMB), Circular A-11, Sections 53 and 300 requires an Agency's IT initiatives be aligned with the FEA and each IT initiative conform to OMB guidance on submitting business cases for IT initiatives; i.e., IT 300 Exhibits. Not only does the OMB guidance require that an Agency's IT submission be aligned with the FEA, but it also requires the Agency's IT submission be grounded in the Agency's enterprise architecture. OMB also provided supplemental guidance[1] and an XML schema[2] for the business case for use by agencies in preparing their IT 300 Exhibits. In DoD, the new information refreshes the information in ITMA from the previous year.

DoD uses the ITMA application and process to develop its IT business case submissions to OMB according to OMB and DoD guidance[3]. DoD Services and Agencies load their data into ITMA according to the OMB direction and the DoD

[1] FY06 A-11 FEA Additional Instructions & Guidance, OMB FEA Program Management Office, June 4, 2004, http://FEAPMO.gov

[2] E-mail **From**: Lauren Uher, **Sen**t: Thursday, May 27, 2004 5:06 PM, **To:** CIO-COUNCIL@listserv.gsa.gov , **Subject**: [CIOCL] A-11 FOR FY2006 -- EXHIBIT 300 XML SCHEMA

[3] E-mail **From:** Hammersley, Bonnie M, SES, OSD-NII, **To**: Roy Mabry, et al, **Sent:**Tuesday, July 20, 2004 2:38 PM, **Subject:** FY06 OSD Policy Guidance for A-11, Exhibit 300 (U)

implementation guidance. FY06 guidance for DoD included a new self-assessment methodology with a certification step to ensure the business case submissions contained accurate information. Self-assessment teams scored the DoD IT business cases and the results were provided to OMB. The DoD EA CoP was not involved with the review and approval of DoD's submission to OMB to ensure OMB guidance was met as it pertained to DoD business case alignment with the FEA and foundation in the DoD EA.

This report documents an analysis that examined the ITMA process and develops guidance and software recommendations that would improve the enterprise architecture aspects of the IT business case preparation. The analysis also examined the use of the DoD EA in aligning IT initiatives with the DoD Mission Areas in the "Portfolio Management Mission Areas And Domains for Fiscal Year 2007"; see table below.

The report discusses the implications of the analysis and makes recommendations for improving the application of DoD EA in the ITMA process to include the portfolio management process. These recommendations suggest ways to use the enterprise architecture aspects for IT business case preparation that would lay the foundation for using DoD EA as a means of linking IT investments with DoD Mission Areas, portfolios and with the FEA.

Guidance

For the FY06 budget process, OMB Circular A-11 requirements did not change from the FY05 budget process. The primary objective was to stabilize the process and increase the quality of the data in agency budget submissions. To facilitate this, OMB also issued a document[4] to provide additional instructions and examples to help agencies complete the FEA-related A-11 requirements of the OMB Exhibits 53 and 300 for IT investments. Specifically the document was developed to:

- Promote increased data quality for agency FY06 budget Exhibits 53 and 300 for IT investments
- Outline relevant changes to the FEA RMs
- Improve the linkage between investment and program performance
- Improve the ability to identify and analyze collaborative opportunities

Over the past year or so, the FEA RMs were updated to reflect agency feedback and lessons learned from the FY05 budget process. While this does not alter the questions or requirements of Circular A-11, it does affect the value options that agencies can choose from a "pick-list." The XML schema for FY06 reflected the

[4] FY06 A-11 FEA Additional Instructions & Guidance, OMB FEA Program Management Office, June 4, 2004, http://FEAPMO.gov

new value options. Through continual refinements to the reference models, OMB continues to strengthen the concept that that the FEA is the basic enterprise architecture for the government.

Some notable highlights from the additional guidance includes:

- Agencies must revisit all of their investments' FEA mappings to ensure proper and accurate alignment to the FEA.
- Non-major IT investments must map to the BRM for inclusion in the Exhibit 53.
- Agencies must use the PRM for any major IT investments requesting new development, modernization, and enhancement (DME) funding beginning in FY05 or beyond.
- The updated XML schema includes the new values to reflect reference model changes but invalid values were not removed and are still in the schema. Agencies must not use any invalid values when mapping to the reference models.
- Agencies must use the tables provided in the guidance to document and discuss IT investments in relation to the SRM and TRM.

On July 20, 2004 DoD issued its own implementing guidance[5] to reflect the OMB guidance. The DoD guidance directed compliance with A-11 Exhibit 300: "DoD will complete the exhibit 300 (CIR) IAW the 99% solution and final schema released by OMB on May 25 2004. If there is inconsistency with other guidance, the schema will supercede." The XML schema also reflects the additional guidance designed to improve data quality for the FEA-related A-11 requirements.

Analysis

Analysis of FY 2004 Process and Timeline for Submitting IT 300 Initiatives

The new cycle begins after locking the President's Budget, usually in December. Planning, producing draft and final guidance, training of staff, and testing of the process and software occurs between the first of the year and May. By the end of May, the DoD system is locked and made ready for the new cycle. No changes can be made after this point. Data entry occurs in a distributed fashion with DoD Components entering the data to meet the production schedule for IT 300 Exhibit submission at the end of September. The process and timeline appear in the Table:

2004 Date	Process Steps
May 25	DoD Locks ITMA

[5] E-mail **From:** Hammersley, Bonnie M, SES, OSD-NII, **To**: Roy Mabry, et al, **Sent:**Tuesday, July 20, 2004 2:38 PM, **Subject:** FY06 OSD Policy Guidance for A-11, Exhibit 300 (U)

May 27	OMB provides final xml schema
June 04	OMB provides additional draft guidance
June 4, noon	ITMA Database for FY05 archived
June 7, 0800	ITMA Opens for FY06
June 29	ITMA Resource Test
	a. MILDEPs upload/send resource file b. test protocol to be provided June 7
June 30	FY06 ITMA Guidance memo published
July 2	Release ITMA 2.5
July 29	ITMA CIR Test
	a. Air Force and Navy upload test CIRs b. test protocol to be provided July 8
August 16	Resource Data Due
August 30	CIRs Due – ITMA locks
September 7	MILDEP/Agencies complete review/mitigate ITMA error report
September 9	Statements of Compliance Due
September 13	Submit to OMB

Table 1 - FY06 IT Budget Justification Schedule

An analysis of the process and timeline as shown in Table reveals that:

- OMB process for publishing changes to the OMB xml schema for enterprise architecture line-of-business and sub-function and the DoD ITMA update cycle to accommodate the changes to ITMA lacks synchronization.
- Updating ITMA to accommodate changes regarding enterprise architecture lines-of-business and sub-functions did not occur. Possible reasons needing further analysis:
  - OMB schema may not have include changes described in the additional guidance of June 4, 2004
  - OMB additional guidance and xml schema arrived after locking of ITMA for FY06.
  - Not enough time between the time OMB xml schema and the opening of ITMA to make the necessary changes.

Other findings of the analysis include:

- No up-front step in the process to validate that enterprise architecture updates have in fact been captured in the updates to ITMA. It is only after the IT-300s are submitted to OMB can they be analyzed. No step in the process for this analysis to occur.

- After compilation of Component enterprise architecture data, there is no quality control step built into the process to ensure that enterprise architecture data is correct and conforms to OMB guidance.
- No EA error report available consequently not review by OSD DoD EA office before submission to OMB.

Analysis of IT 300 Initiatives

There were 171 DoD IT 300 Submissions. One may see an abridged version of the list of these initiatives in Table below[6] to get an understanding that the EA scores are associated with the UID for each IT initiative according to OMB and DoD guidance. The analysis shows:

- The Department of the Navy submitted 33 IT 300 initiatives.
- The Department Army submitted 43 IT 300 initiatives.
- The Department Airforce submitted 22 IT 300 initiatives.
- The Defense Agencies submitted 73 IT 300 initiatives.

Code 53 (UID)	Subject	EA
007-97-01-16-01-0734-00-404-142	ELECTRONIC DOCUMENT MANAGEMENT PROGRAM	5
007-97-01-20-01-0134-00-201-067	DEFENSE JOINT MILITARY PAY SYSTEM - ACTIVE AND RESERVE COMPONENTS	3
007-97-01-29-01-6534-00-404-999	DOD EMALL	5

Table 2- Abridged List of IT Investments and UID Code

Integral to the EA scores and given the DoD self-scoring approach, 47 of 171 IT initiatives or 27% scored 3 or lower on the Enterprise Architecture section. Of those 47, 74% scored lower than 3, while 26% scored exactly 3. A score of 3 or lower puts the IT initiative at risk.

Analysis of Unique Identifier (UID)

The unique ID is composed based on the specific information that is required for each digit. OMB guidance says: "Populate the Last Six Digits of the Unique Project ID (UID) Once the primary BRM mapping has been identified, agencies must identify the appropriate digits for the UID code using the FY06 BRM codes located in the appendix of [OMB's guidance] …document. The last six digits of the 23-digit UID (see below) represent the primary Business Area, LoB, and Sub-function that the investment best support." This guidance is graphically shown in following figure.

Among other things and of particular interest, the OMB guidance states:

[6] E-mail From: Hammersley, Bonnie M, SES, OSD-NII; Sent: Thursday, September 16, 2004 5:15 PM, Subject: DoD FY06BES Self Scores (U)

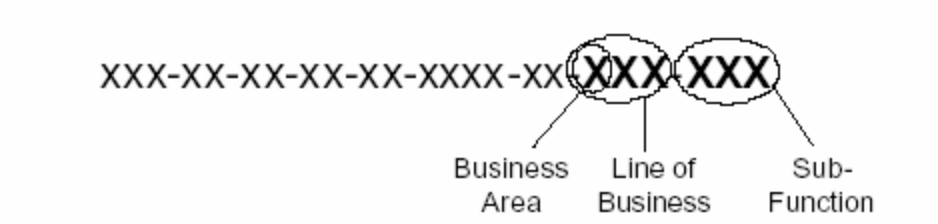


Figure 1. Decoding the EA Portion of the Unique ID

- "Mode of Delivery" is no longer a primary business area in the BRM, therefore agencies may no longer use the “2XX: Primary Mode of Delivery layer” unless an agency receives prior OMB approval by no later than August 13, 2004.
- "A primary LoB mapping must be identified for all investments -- “100,” “200,” “300,” and “400” will not be acceptable 3 digit codes for the 18th, 19th, and 20th digits of the unique ID number unless an agency receives prior OMB approval by no later than August 13, 2004."
- A primary Sub-function mapping must be identified for ALL investments therefore, “999” will not be an acceptable 3 digit code for the 21st, 22nd, and 23rd digits of the unique ID number unless an agency receives prior OMB approval by no later than August 13, 2004.

The analysis of the UID for DoD IT investments shows the following:

- Eighteen DoD IT 300 investment submissions used 999 in 21st, 22nd, and 23rd digits of the unique ID. This contradicts OMB guidance.
- Eighty-six IT 300 investment submissions used the “100”, “300”, or “400” series as the primary business area with the Line of Business code in positions 19 and 20. This is not in consonance with OMB guidance.
- Sixty-eight IT 300 investment submissions used 2xx Mode of Delivery as a primary business area. This contradicts OMB guidance.
- Three IT 300 submissions used LOB codes that did not appear in the June 4, 2004, FY06 A-11 REA Additional Instructions & Guidance. Two used LOB 131 code, while one used code 133. This contradicts OMB guidance.

This analysis of the UID information as compared to the OMB Guidance is summarized in the following table:

Eighteen IT 300 investment submissions used 999 in 21st, 22nd, and 23rd digits of the unique ID. This contradicts OMB guidance	Eighty-six IT 300 investment submissions used the "100", "300", or "400" series as the primary business area with the Line of Business code in positions 19 and 20. This is not in consonance with OMB guidance.	68 IT 300 investment submissions used 2xx Mode of Delivery as a primary business area. This contradicts OMB guidance.
Three IT 300 submissions used LOB codes that did not appear in the June 4, 2004, FY06 A-11 REA Additional Instructions & Guidance. Two used LOB 131 code, while one used code 133. This contradicts OMB guidance.		

Table 3 - UID Code Analysis for DoD IT 300 Investments[1]
Analysis of Budget Categories

Analysis of Portfolio Management Mission Areas and Domains

In FY03 – FY05, Global Information Grid resources were shown by categories for Business Applications, Warfighting, National Security Systems, Shared Infrastructure, Information Assurance Activities, and Related Technical Activities. For FY06, GIG Budget Categories[7] were used. For FY07, IT will be managed by Portfolio Management Mission Areas:

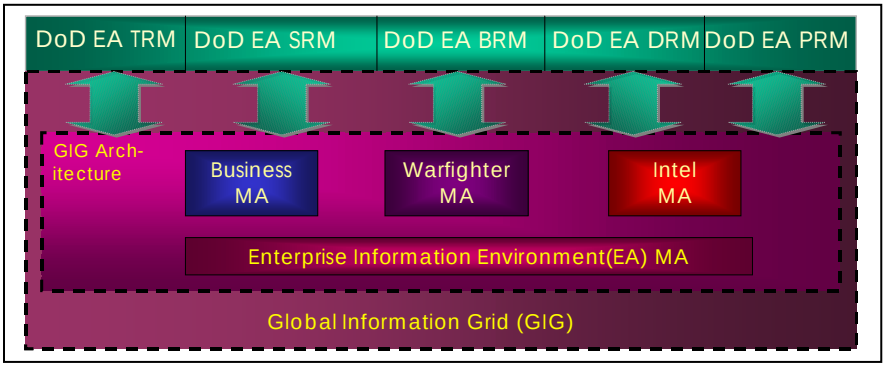
PORTFOLIO MANAGEMENT MISSION AREAS AND DOMAINS Fiscal Year 2007			
A. Warfighter[8] Mission Area	**B. Business Mission Area[9]**	**C Intelligence Mission Area[10]**	**D Enterprise Information Environment Mission Area[11]**
1. Battlespace Awareness 2. Force Application 3. Protection 4. Focused Logistics 5. Battlespace Communication Systems	1. Installations and Environment 2. Human Resources Management 3. Acquition 4. Strategic Planning and Budgeting 5. Logistics 6. Accounting and Finance	1.Domains TBD	1. Information Assurance 2. Communications 3. Computing 4. Core Enterprise Services

Table 4 – Portfolio Management Mission Areas and Domain Categories

[7] DoD Financial Management Regulation, Volume 2B, Chapter 18, June 2004, From: Hammersley, Bonnie M, SES, OSD-NII Sent:Monday, May 17, 2004 6:47 PM, Subject: FMR Chapter 18 (U)
[8] Deputy Secretary of Defense Memorandum, Information Portfolio Management, March 22, 2004
[9] Ibid
[10] Management Initiative Decision, No. 918, For Official Use Only, Unsigned, Undated
[11] Department of Defense, Chief Information Office Memorandum, Enterprise Information Environment Mission Area, Domain Owner Designation, July 14, 2004

Analysis of DoD EA with Mission Areas

The DoD EA is composed of the portfolio management mission areas and a series of EA RMs as shown in the figures below:



DoD EA TRM - Technical Reference Model
BRM - Business Reference Model
SRM - Technical Reference Models
DRM – Data Reference Model
PRM – Performance Reference Model
MA- Mission Area

Figure 2. DoD Enterprise Architecture

The DoD Mission Areas were used by the DoD EAC CoP to align the DoD EA with the FEA.[12] During FY04, the EAC CoP aligned the DoD EA with the FEA to provide a mechanism for aligning IT investment's Exhibit 300s with the FEA.

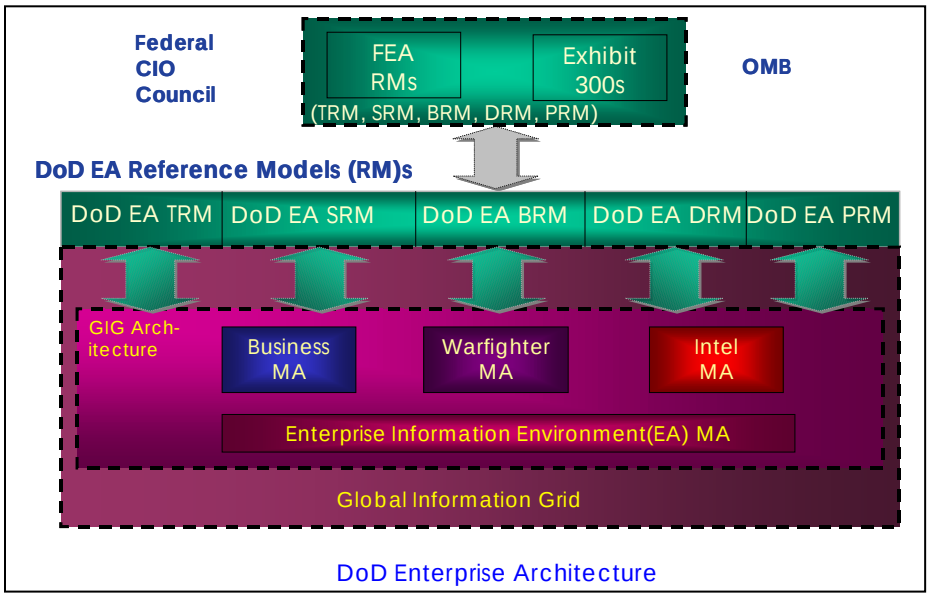


Figure 3. DoD EA Aligned with the FEA

[12] Federal Enterprise Architecture, October 2003, http://www.FEAPMO.gov

Analysis of DoD EA BRM[13] Alignment with the FEA BRM

This analysis only discusses the DoD EA BRM alignment with the FEA BRM. The DoD EA took the FEA as a given and aligned the DoD EA with the FEA through a set of five RMs. For a complete treatment of the alignment of other DoD EA RMs with the FEA RMs see the DoD EA at http://www.dod.mil/nii/.

The DoD EA is organized around mission areas and extracts of architecture information about DoD work processes, information concepts, information technology, and IT performance measurement concepts useful for aligning DoD IT 300 initiatives with the mission and then with the FEA. The alignment of the DoD EA BRM with the FEA BRM is shown in the following series of Figures. These figures show the alignment of DoD EA Mission Areas with the taxonomy and vocabulary of the FEA BRM. The determination of whether a DoD activity is aligned with a Line of Business (LOB) and Sub-Function is made based on the likeness of functional associations. The fact that DoD work can be aligned with most LOBs and Sub-Functions in the FEA BRM indicates that DoD has its own citizenry such as the warfighter and his or her dependents, which must be serviced by DoD to provide services similar to those that the Federal government provides for the nation's citizenry at large. All the activity that exists in DoD exists solely because of its contribution to the mission or because of its service for the DoD Citizen. The alignment of the DoD EA with the other FEA Business Area LOB and Sub-functions can be seen in the figures that follow:

[13] DoD Enterprise Architecture Reference Models, Version, .03, http://www.dod.mil/nii/

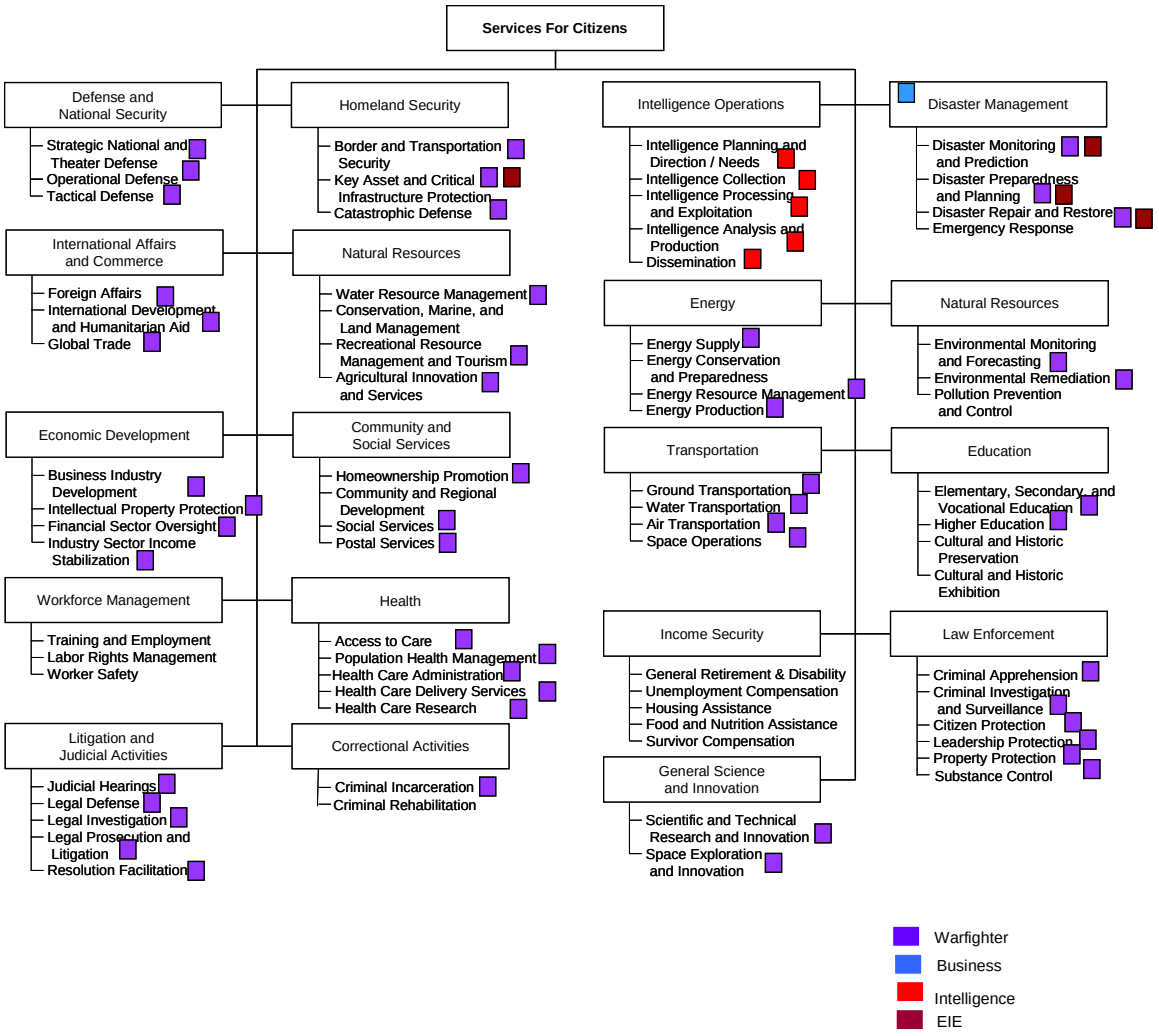


Figure 4. DoD EA BRM Alignment with FEA BRM Services for Citizens, Lines of Business and Sub-functions

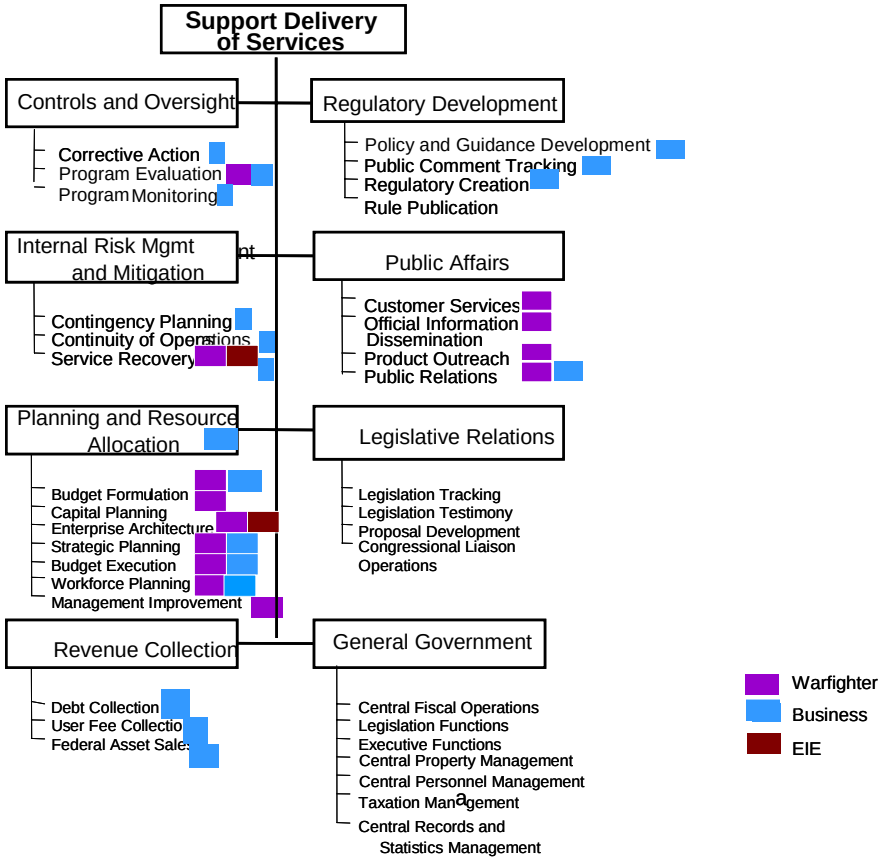


Figure 5. DoD EA Mission Area Alignment with FEA BRM, Support Delivery of Service, Line of Business and Sub-functions

The DoD EA aligns with most of the LOBs except Revenue Collection, Regulatory Development, Legislative Relations and General Government in the Support Delivery of Service Business Area. This is not to say that DoD does not perform these activities but it is only to say that enterprise architecture work is not being conducted in those areas.

Similarly, the DoD EA aligns with most of the LOBs under the Management of Government Resources Business Area as can be seen in following figure.

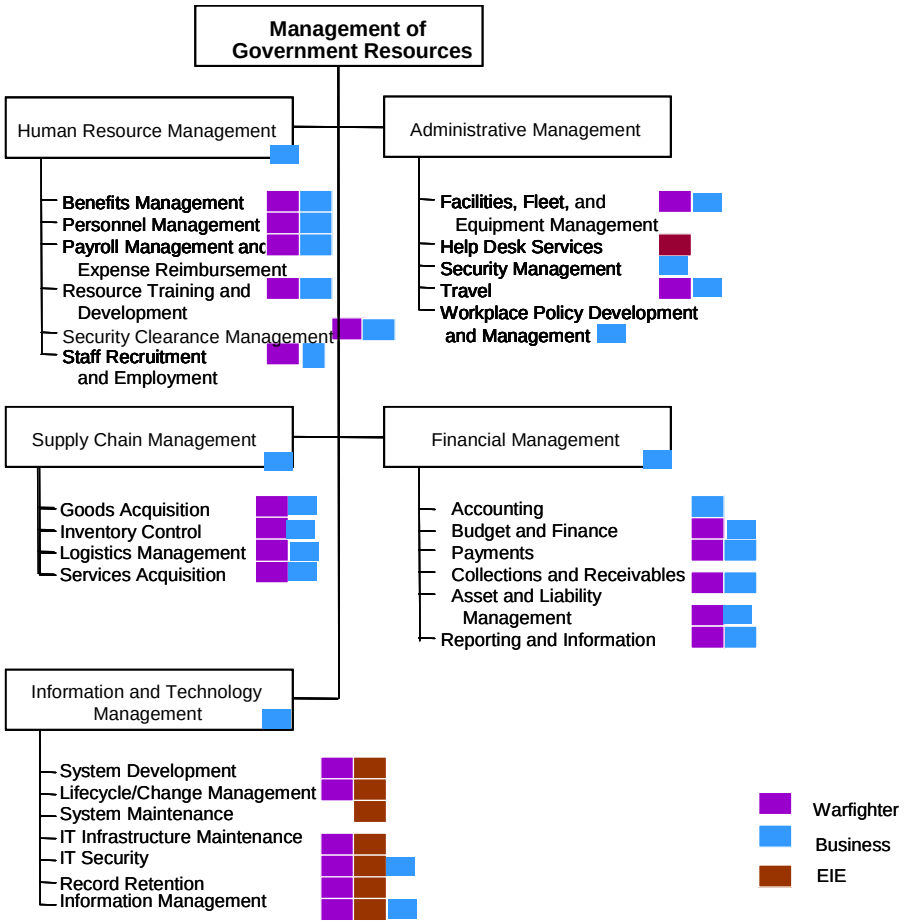


Figure 6. DoD EA Mission Area Alignment with FEA BRM, Management of Government Resources, Line of Business and Sub-functions

The alignments shown in Figures 4, 5 and 6 serve as the foundation for aligning IT 300 initiatives with the DoD EA BRM and the FEA BRM. This alignment answers the OMB A-11 question for EA that asks whether the IT investment is in the Agency EA and what the alignment of the initiative is with the FEA. How these questions can be answered using the information in preceding tables and figures can be seen in the following table that shows the Abridged List of DoD IT 300 Initiatives aligned with FEA and DoD EA.
This illustrates the point that DoD EA has already laid the foundation for linking the IT initiatives with the FEA and the DoD EA and portfolio mission area categories.

Code 53 (UID)	FEA	DoD EA
007-17-01-01-01-1158-00-402-125	Navy, Mgt Gov Res, FMgt, Budget & Finance	Business Mission Area
007-17-01-01-01-4033-00-402-125	Navy, Mgt Gov Res, FMgt, Budget & Finance	Warfighter Mission Area
007-57-01-19-01-5100-00-405-145	AF, Mgt Gov Res, Supply Chain Mgt, Logistics Mgt	Warfighting Mission Area
007-57-01-19-01-5576-00-405-145	AF, Mgt Gov Res, Supply Chain Mgt, Logistics Mgt	Warfighting Mission Area
007-57-01-19-01-6962-00-405-145	AF, Mgt Gov Res, Supply Chain Mgt, Logistics Mgt	Warfighting Mission Area
007-97-01-01-01-1271-00-402-125	Defense Agency, Mgt of Gov Resources, Financial Mgt, Budget & Finance	Business Mission Area
007-97-01-01-01-1760-00-402-125	Defense Agency, Mgt of Gov Resources, Financial Mgt, Budget & Finance	Business Mission Area
007-97-01-01-01-1761-00-402-125	Defense Agency, Mgt of Gov Resources, Financial Mgt, Budget & Finance	Business Mission Area
007-97-01-31-01-6312-00-401-122	Def Agency, Mgt of Gov Resources, Admin Mgt, Travel,	Warfighting & Business Miss

Table 5- Abridged List of DoD IT 300 Initiatives Aligned with FEA and DoD EA

The analysis of the unabridged list show that of the 171 IT 300 initiatives that were submitted by DoD Services and Agencies, 88 contained errors in the Unique ID in the last 6 digits of the number. Recall the last six digits are the ones used to align the IT 300 initiative with the Federal Enterprise Architecture. Due to these errors, only 84 initiatives were further analyzed to determine whether an association could be made between the IT 300 initiative and the mission area descriptions found in the DoD EA. Sixty-four submissions were easily associated and were aligned with Warfighter Mission Area. Twenty submissions seemed associated with the Business Mission Area but further analysis is needed. Intuitively the twenty IT initiatives should fall under the Management of Government Resource Business Mission Area. This association was indicated by the figures shown above, however, the alignments were not found in the tables of the DoD EA BRM. Therefore further analysis is needed of the description of each of the 20 initiatives to determine whether the Warfighting Mission Area, Business Mission Area, or both are the proper classification for the IT initiative or whether the LOB and Sub-Function for these twenty initiatives should be added to the DoD EA for Management of Government Resources Business Mission Area.

Analysis of DoD EA SRM, TRM, DRM and PRM [14] Alignment with the FEA SRM, TRM, DRM and PRM

Analyses of the DoD EA SRM, TRM, DRM and PRM along with a more through analysis of the BRM, is not possible at this time. For this analysis to occur, various reports are needed from ITMA. Without these reports there is no visibility into the DoD submission of its IT 300 initiatives for EA data quality control. Unless better visibility occurs the data quality of the EA portion of the IT 300 submission will remain poor and unchecked.

[14] DoD Enterprise Architecture Reference Models, Version, .03, http://www.dod.mil/nii/

Analysis of Leveraging DoD EA for Improving Efficiency & Effectiveness, the Value Proposition

In the figure below, all five of the FEA RMs are represented by the bar labeled the "FEA RM" in the center of the figure. Next to that, all five of the DoD EA RMs are represent by the bar labeled "DoD EA RMs."

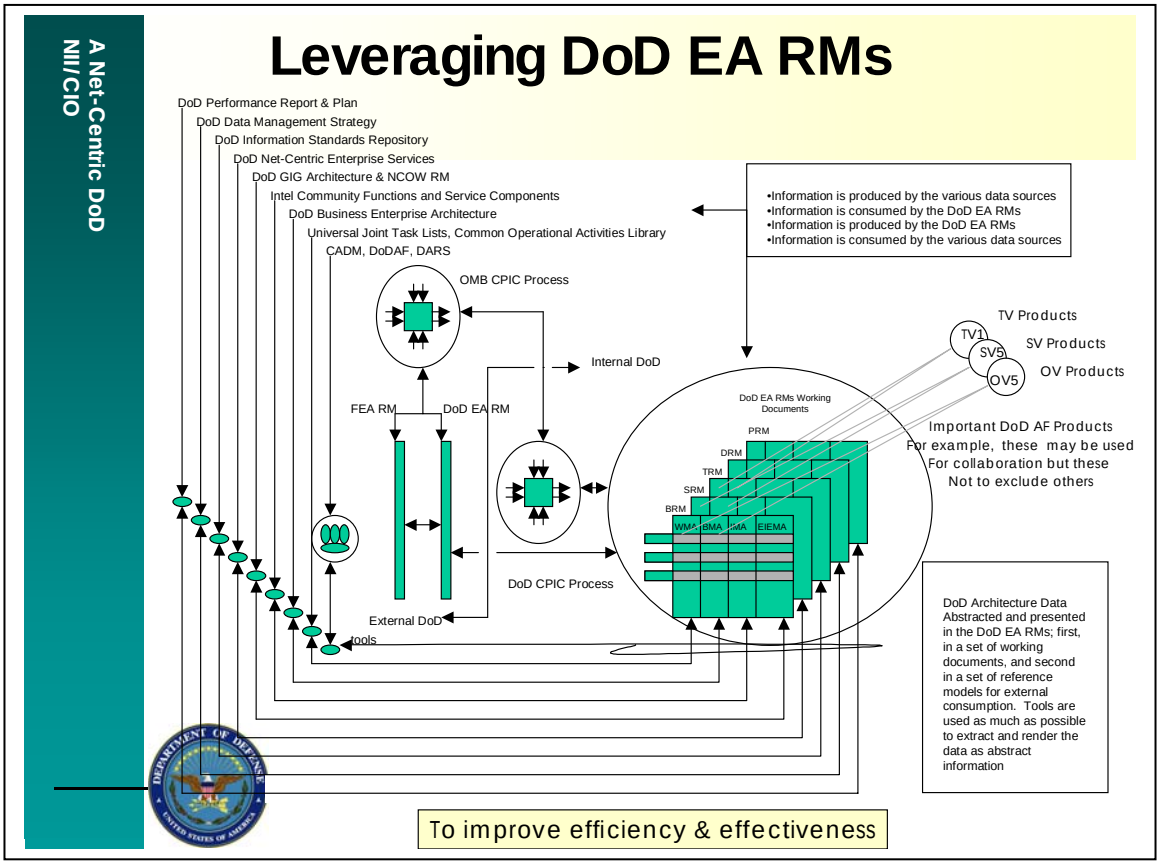


Figure 7. Leveraging DoD EA to Improve Efficiency & Effectiveness

The line to the right of the DoD EA RM bar represents the line separating the internal and external representation of the DoD EA. To the right of the line, the process symbols represent the internal CPIC management process of the Department and uses all five of the DoD EA RMs for horizontal analysis of the Department's IT initiatives by Mission Area – the Warfighting, Business, Intel and EIE Mission Area. Still further to the left, the DoDAF views are shown as a mechanism to bring clarity to any discussion about process improvement, the enablement of new process with modern technology and to assess the degree of net-centricity represented by an existing architecture.

To the left of the line, the results of the horizontal analysis are presented as they line-up with the FEA RMs. The FEA RMs were taken as a given and are

represented in the DoD EA RMs. As process improvement occurs, as elimination of duplication occurs, as modern IT is applied to enable new and improved processes and, as IT is better aligned with the strategic mission and outcomes of the Department, the DoD EA RMs become a more mature representation of the DoD EA.

In the upper left corner of the figure are the information sources that are used to populate the DoD EA. From viewing the figure, the reader can see from the two way arrows that, as the information sources change, so does the DoD EA and vice versa. Modern EA tools and concepts are shown as a means to facilitate the analysis.

Discussion

Process Analysis and Timeline Discussion

Unless the OMB process for publishing changes to the OMB XML schema for enterprise architecture LOB and Sub-Function or the DoD ITMA update cycle are better synchronized to give time to make changes to ITMA, ITMA will never be able to accurately reflect the last minute changes from OMB nor accurately reflect EA data. Two options to gain efficiency in the process my may be available

One option is that OMB takes steps to give more lead-time on the front-end of the process. DoD needs final guidance by May 1 to make and validate OMB changes in ITMA in order to meet the timelines for subsequent process steps. This is illustrated in the following table with the aqua highlight. However, given the unlikelihood of OMB making this process change, DoD must look internally to find efficiencies in its ITMA process. The green highlight indicates the second option where efficiencies might be gained.

2004 Date	Process Steps
May 1	OMB Submits final changes to guidance & XML schema
May 15	DoD makes and validates changes to ITMA
May 25	DoD locks ITMA
May 27	OMB provides final xml schema
June 04	OMB provides additional draft guidance
June 4, noon	ITMA database for FY05 archived
June 15, noon	DoD makes and validates changes to ITMA
June 18, 0800	ITMA opens for FY06
June 29	ITMA resource test
	a. MILDEPs upload/send resource file b. test protocol to be provided June 7

Table 6- Possible Options to Gain Efficiency in ITMA Process

Furthermore, the current process fails to allow adequate quality control steps or time to ensure that DoD EA data conforms to OMB guidance. No EA error report exists for the DoD EA CoP to review. Consequently no review occurs regarding EA data quality before submitting the IT 300 Exhibits to OMB. Even after the IT-300s are submitted to OMB there is still no step in the process for the DoD EAC

2004 Date	Process Steps
…	…
June 30	FY06 ITMA Guidance memo published
July 2	Release ITMA 2.5
July 29	ITMA CIR Test
	a. Air Force and Navy upload test CIRs b. test protocol to be provided July 8
August 16	Resource data due
August 30	CIRs due – ITMA locks
September 7	MILDEP/Agencies complete review/mitigate ITMA error report
September 9	DoD EAC CoP reviews accuracy of EA data
September 12	Statements of Compliance due
September 15	Submit to OMB

Table 7 – Changes in IT Budget Process to Improve EA Data Quality

CoP to analyze them. Possible changes in the process may be seen in Table 7. The red highlights show where potential improvements may be made. A process step is added to allow the DoD EA community to review the accuracy of EA data. By inserting this step, the remainder of the process is slipped by only a couple of days. In practice, in the FY06 cycle, the submission to OMB did not occur until late September, showing that there is some flexibility in the schedule to accommodate process changes.

Discussion of the IT 300 Initiatives Analysis

As noted above in the analysis section and given the DoD self-scoring approach, 47of 171 IT initiatives, or 27% scored 3 or lower on the Enterprise Architecture section. Of those 47, 76% scored lower than 3, while 24% scored exactly 3. A score of 3 or lower puts the IT initiative at risk.

Poor EA scores may be an indicator of programs needing help moving toward the target IT architecture of net-centricity. Also poor architecture scores may indicate the IT initiative may not be aligned with the mission of the DoD enterprise transformation goals, and the IT initiative may not be capable of operating in a net centric and service oriented environment. It may also be an

indicator that a standards and information technology acquisition plan may not be documented such that it would move the initiative closer to the alignment with the DoD EA and the net-centric environment.

While poor EA scores may be an indicator of poor EA understanding, it may also represent an opportunity for education and training about IT EA, net-centricity and EA program development.

Discussion of the Unique Identifier (UID) Analysis

The analysis shows that the architects in the Services and Agencies did not follow the OMB or DoD Guidance[15] regarding construction of the Unique ID. This is an indication that training needs to be worked into the process as well as a quality control step to improve the quality of EA data in the IT 300 Exhibits. A training step could be worked into the process as shown below with yellow highlights. Training could occur in one day, repeating the training on the second day for those not able to attend on the first day.

2004 Date	Process Steps
May 1	OMB submits final changes to guidance & xml schema
May 15	DoD makes and validates changes to ITMA
May 25	DoD locks ITMA
May 27	OMB provides final xml schema
June 04	OMB provides additional draft guidance
June 4, noon	ITMA database for FY05 archived
June 15, noon	DoD makes and validates changes to ITMA
June 16, 17	DoD provides training on new OMB Guidance
June 18, 0800	ITMA opens for FY06
June 29	ITMA resource test
	a. ILDEPs upload/send resource file b. test protocol to be provided June 7

Table 8 - Training Step in ITMA Process to Improve EA Data Quality

Portfolio Management Mission Area and Domain Discussion

Even though MID 918 has not been signed, the Intel Mission Area plans, acquires and budgets for IT in the Intel Mission Area. While Intel for the Warfighter is the most important Intel issue facing the Department, the Department does play a role in the larger community.

[15] **From:** Hammersley, Bonnie M, SES, OSD-NII, **Sent:** Tuesday, July 20, 2004 2:38 PM, **Subject:** FY06 Policy/Guidance for A-11, Exhibit 300 (U)

DoD executives are addressing the full range of Intel issues to realize the larger objectives of the DoD Enterprise; as well as its participation in the Intel Community at large. From the U.S. perspective and, given the global mission of DoD, intel assets necessary for carrying out the mission will likely remain under the control of the Department. Associating the IT with that warfighting purpose in the Warfighting Mission Area portfolio not only gives the Department executives oversight of those critical assets but also oversight of intel assets that may be devoted for the common purpose of supporting the IC community. With this knowledge, the DoD executives may make decisions with greater precision than deciding without the knowledge. By distinguishing between intel IT assets which support the Warfighting Mission Area portfolio, and the Intel Community Mission Area at large, DoD executives gain visibility over this critical aspect of the budget. This ensures that the Department's mission capabilities are enabled by the critical intel IT assets necessary for accomplishing DoD's mission and that the assets remain under oversight and control of the Department's executives.

By reviewing the figure in the preceding section, the reader sees that the codification of the intel assets by Mission Area, to include the Defense Strategic, Operational and Tactical defense has already begun. Additional insights may be yet to come for DoD Executives who must make decisions about intel IT assets based on their purpose of either supporting the warfighting mission, or whether an intel IT asset enables only the mission of the larger Intel Community.

Discussion of the DoD EA Mission Area Analysis

The DoD EA and its set of RMs can play a significant role in the portfolio management process. These RMs hold promise for internal mission area analysis, cross-mission area analysis and for the evaluation parts of the portfolio management process. Their potential value comes from using them to improve efficiency and effectiveness by organizing architecture data into an enterprise framework that can be used for work process improvement and improved alignment of the IT with the Department's mission.

The strategic thrust provided by the DoD EA mission area analysis focuses on leveraging architecture for decision making in support of key DoD transformational initiatives, specifically including net-centric operations, portfolio management and modeling/simulation through executable architectures. An additional objective is to increase the quality of architecture data across the Department, and use the DoD EA to link complex enterprise architecture information produced by the DoD Architecture Framework (DoDAF). The DoD EA Mission Area Analysis indicates the large potential for improvement in the Department that comes from these advances in enterprise architecture.

Discussion of the Analysis of DoD EA BRM[16] Alignment with the FEA BRM

Alignment of the DoD EA Mission Areas with the FEA provides OSD with a framework for Aligning IT 300 Exhibits with the FEA. . The DoD EA BRM at http://www.dod.mil/nii contains a table, *Program Manager's Guide to the Appendices.* The guide is a quick look at where to find the information for the mapping between FEA and DoD Lines of Business.

Beginning with the President's FY05 Budget Preparation process, Federal agencies aligned their budget requests with the President's Management Agenda and the FEA. DoD mapped their major IT capital investments to the business lines identified in the FEA BRM, and described how their initiatives supported the FEA BRM LOBs and Sub-Functions.

Discussion of the Analysis of the DoD EA SRM, TRM, DRM and PRM [17] Alignment with the FEA SRM, TRM, DRM and PRM

Analysis of the DoD EA SRM, TRM, DRM and PRM, along with a more through analysis of the BRM, is not possible at this time. For this analysis to occur the following reports are needed from ITMA. The data for these reports is collected through the IT 300 and 53 data collection process. The requirements are specified in OMA A-11 guidance for the IT 300 and 53 Exhibits provide the section references in the report descriptions below.

- Report 1. Unique ID, Subject, description of how the investment supports DoD's mission and strategic goals and objectives (I.B.1.IT300 Guidance), both performance tables (1.C.), Comparison of OMB-Approved Baseline and Actual Outcome for Phase/Segment/Module of a Project (Investment) -- all fields (I.H.4.A & B.1, 2, 3).
- Report 2. II.A.1 Business. Table II. A. 1. Unique ID, Subject and all other fields in this section.
- Report 3. II.A. 2. Data. Unique ID, Subject and all other fields in this section.
- Report 4. II.A.3 Applications, Components, and Technology. Unique ID, Subject and all other fields in this section.
- Report 5. II. B. Security and Privacy. Unique ID, Subject and all other fields in this section.
- Report 6. Unique ID, Subject and all other fields in the section "For information technology investments only:" a-f.

Without these reports there is no visibility into the DoD submission of its IT 300 initiatives for EA data quality control. Unless better visibility occurs, the data

[16] DoD Enterprise Architecture Reference Models, Version, .03, http://www.dod.mil/nii/
[17] Ibid

quality of the EA portion of the IT 300 submission will remain poor and unchecked.

In order to provide these reports, the ITMA software would have to change to accommodate the production of these reports. Another option may be to produce the data in XML format for consumption by another application that produces these reports.

A Discussion: Leveraging DoD EA RMs for Improving Efficiency & Effectiveness - the Value Proposition

Cross-mission area analysis or horizontal analysis as it is also known makes a valuable contribution to improving efficiency and effectiveness in the analysis step in the DoD portfolio management process. The horizontal analysis also improves the efficiency and effectiveness of the enterprise by better aligning IT with the mission and strategic outcomes of the Department. Before the select phase in the portfolio management process can happen, an analysis phase must occur. The DoD EA provides a context for this analysis and mechanism for aggregating complex architecture data in a fashion that is presentable to business executives who are interested in options and recommendations presented in a way that is easily digested, to facilitate their decision making.

Another significant use of the DoD EA is to associate the DoD IT initiatives with the FEA and answer the architecture questions in the OMB Cir A-11 guidance about whether DoD's IT initiatives are associated with the agencies enterprise architecture and whether the IT is aligned with the FEA. By using the DoD EA we can answer yes to the first question and show how the IT alignment with the FEA is associated with DoD EA.

The value proposition of the DoD EA rests within its capacity to improve Departmental efficiency and effectives on an enterprise scale.

The DoD EA value proposition may be summarized. It:

- provides a common language to facilitate linkage of complex architectures
- provides a unifying organizational approach for complex architectural data
- better aligns architecture with the DoD business and warfighting mission;
- lowers the cost of compliance with the OMB Circular A-11 requirements;
- supports the reduction of redundant IT
- improves effectiveness of the mission by aligning IT with the mission, by better aligning IT with the Department's strategic the outcomes and by improving the alignment of IT with the transformation goals of the Department
- improves the efficiency of the process for IT management

- gives increased visibility to IT and its contribution to efficiency and effectiveness, therefore measuring it and examining it;
- provides EA information to inform the resource allocation process;
- assists DoD Architects by promoting the sharing of a common taxonomy;
- improves IT decisions by the mission area executives and managers.

Recommendations

Process, Timeline, IT 300 Initiatives and UID Recommendations

In the analysis and discussion sections the following topics were separately addressed:

- Process and timeline analysis and discussion
- IT 300 Initiatives analysis and discussion
- UID analysis and discussion

In this section these topics are treated collectively because most issues and recommendations come from their connection to changes in the process timeline.

The FY06 process is used as a frame-of-reference for presenting the recommendations however the timeline for FY07 will deviate. Conceptual timeframes, however, should be valid.

- Change the process to include a step where NII Resource Management Directorate makes the necessary changes to the ITMA software and NII Architecture & Interoperability Directorate validates the changes that are EA related.
- Insert a process step where NII Resources Management and the Architecture & Interoperability Directorate provides training on new OMB Guidance to include DoD EA implementation guidance.
- Move the date that ITMA opens to 3rd day after validation occurs

June 15, noon	DoD makes and validates changes to ITMA
June 16, 17	DoD provides training on new OMB Guidance
June 18, 0800	ITMA Opens for FY06
…	…
September 9	DoD EAC CoP reviews accuracy of EA data
September 12	Statements of Compliance Due
September 15	Submit to OMB

Table 9- Additional Steps in ITMA Process to Improve EA Data Quality

- Insert a process step for DoD EAC CoP to review accuracy of EA data submissions – September 9, 2004.

- Lengthen the process by a couple of days to accommodate the EA data quality validation step – from September 13, 2004 to September 15, 2004
- Develop training syllabus in parallel with this process for additional training for those with poor EA scores.
- Make opportunity for additional training for programs with poor EA scores outside the above process but early in the calendar year.
- Conduct additional training outside the scope of the above process on use of DoD EA data, IT 300 data for improving enterprise efficiency and effectiveness.
- Recommend this training include all Service & Agency Architects and Resource Management personnel.

Portfolio Management Mission Area Recommendations

The DoD EA has already begun to lay the foundation for organizing IT assets by Mission Area portfolio as can be seen from the example in the analysis section above. To further advance the state of practice of using DoD EA for improved portfolio management, recommend the following:

- Intel activities supported by IT that are warfighter-related should be in Warfighting Mission Area while the IT associated with larger Intelligence Community (IC) activities solely in support of the larger IC should be included in the separate Intel Mission Area portfolio, the distinction being one of purpose: Is the purpose of the Intel IT asset to support the Warfighting Mission of the Department or is its purpose solely to support the IC at large?
- The Intel Mission Area should stand alone even if the DoD policy on Portfolio Management[18] fails to specify it as such. The Portfolio Management categories for FY07 IT budget purposes, previously shown in the analysis section, indicates that at least for IT budget purposes Intel will be treated as a Mission Area.
- Use the DoD EA to assess Intel business activity and related IT.
- Align Intel business activity and related IT that supports the Warfighter Mission Area portfolio using the DoD EA.
- Align non-warfighter Intel activity with the Intel Mission Area portfolio using DoD EA.

Intel IT needs special attention from the executives of the DoD Enterprise, particularly in light of TPPU and the debates in Congress with the current administration affecting the IC at large. By reviewing the Portfolio Management categories for FY07 IT budget purposes shown in the analysis section, it indicates that at least for IT budget purposes in FY 07, Intel will be treated as a Mission Area. Therefore, IT initiatives need to be identified for this mission area and need to be given the visibility and organization that managing them by portfolio gives them. By doing so, the Department will be in a better position to

[18] Deputy Secretary for Defense Memorandum , Subject: Information Technology Portfolio Management, March 33, 2004

carryout the agreed upon solution regarding budgets of Intel agencies in a way that is at first and foremost in the best interest of the Department and the IC at large.

DoD EA Mission Area Recommendations

As discussed in the analysis section, the DoD EA can play a significant role in the portfolio management process through its enabling capability for mission area analysis. Significant value also rests with its potential to improve efficiency and effectiveness by leveraging the DoD EA to perform cross-mission area analysis and by organizing integrated architecture data into a unifying enterprise framework that can be further used to organize areas with potential opportunities for work process improvement and improved IT alignment with the Department's mission, strategic outcomes, and transformation goals.

The DoD EA Mission Area Analysis indicates the largest potential for improvement in the Department that comes from these advances in DoD EA; therefore, it is recommend the DoD EA be applied as follows:

- Establish a joint analytical process between the NII Resource Management and Architecture and Interoperability Directorates to leverage ITMA process guidance and software.
- Use the guidance and software to improve the efficiency and effectiveness of the DoD to include the IT management process through DoD EA cross mission area analysis.
- Leverage the architecture for making decisions in support of key DoD transformational initiatives.
- Use DoD EA reference models for internal mission area analysis and cross-mission area analysis for the portfolio management process.
- Use DoD EA to improve efficiency and effectiveness by:
    - organizing the integrated architecture data into a unifying enterprise framework that is provided by the DoD EA;
    - take action to improve work process and improve alignment of the IT with the Department's mission using the DoD EA PRM.
- Leverage the joint process and ITMA process, guidance and software in support of key DoD transformational initiatives for decision making using DoD EA to include decisions about net-centric operations, portfolio management and modeling/simulation through executable architectures.

DoD EA BRM Alignment with the FEA BRM Recommendations

To facilitate the use of the DoD EA as a DoD-wide RM, recommend that language be included in the annual OSD IT300 and 53 guidance, which is jointly produced in collaboration by NII Resource Management Directorate and the Architecture & Interoperability Directorate, to require DoD organizations to use the DoD EA to categorize their LOBs/Internal Functions and Sub-Functions

supported by their IT investments by Portfolio Mission Area. Also, language should be included to require DoD agencies to use the other DoD EA RMs to better align their IT with the DoD enterprise mission and transformation goals. This approach will begin to institutionalize the use of the DoD EA in the analysis part of the DoD portfolio management process. Language should also require DoD organizations to use the DoD EA to inform their own EA business architectures linking them to the DoD EA through the taxonomy of each DoD EA RM and to guide the development and submission of business cases. Finally,
.

- DoD should determine if other agencies play a role in their LOBs/Internal Functions and investigate opportunities for collaboration.
- DoD should use DoD EA BRM and business case information to identify opportunities for cross-agency collaboration.
- Describe and map joint business cases in terms of the DoD EA and FEA.
- Describe and map all DoD IT initiatives in terms of the DoD EA and FEA.

The result should be improved quality of service at a lower cost for the Federal business area called Defense and National Security, Services for the Citizen.

As DoD IT investment requests are being prepared, DoD organizations should use the DoD EA BRM to identify the LOBs that they support. By taking this approach, DoD organizations should then identify the key IT investments that contribute to the work and to the LOBs in the FEA. The DoD's NII, Resource Management and Architecture & Interoperability Directorates, in collaboration, should directly and in conjunction with LOB personnel, review the DoD EA BRM data, as presented in the Federal Enterprise Architecture Management System (FEAMS), to identify other agencies that are performing similar lines of business, and compare their investment requests to the current or planned IT capabilities of the overlapping agency. Where an opportunity may exist for collaboration, agencies should begin communication prior to the development and submission of their own, separate business cases.

DoD EA SRM, TRM, DRM and PRM Alignment with the FEA SRM, TRM, DRM and PRM Recommendations

As noted in the analysis section, the DoD EA SRM, TRM, DRM and PRM, along with a more through analysis of the BRM, is not possible at this time. For such an analysis to occur, a set of reports is needed to be produced by ITMA. These reports are listed in the analysis section. Without these reports, there is no visibility into the DoD submission of its IT 300 initiatives for EA data quality control. Unless better visibility occurs, the data quality of the EA portion of the IT 300 submission will remain poor and unchecked. In order to provide these reports, ITMA software probably needs to change to accommodate the production of these reports. Other options also may be available; i.e., ITMA is to

produce the needed XML data for consumption by another application that produce these reports. Given this discussion the following is recommended:

- ITMA provide the six EA reports called for in the analysis section.
- Change ITMA to accommodate the production of these reports.
  - If not possible, provide XML data for consumption by DoD EAC CoP application to be acquired to produce these reports.
  - Fund the contractor to develop the necessary reports using the XML data.
- Improve the visibility into the DoD IT 300 initiative submissions for purposes of EA data quality control by analyzing and acting on the data in the reports.

Recommendations for Leveraging the DoD EA to Improve Efficiency and Effectiveness - the Value Proposition for DoD EA

Recommend that the Department make use of the DoD EA in the analysis step in the DoD portfolio management process, using it to look horizontally across mission areas for collaboration opportunities to improve process, application of more modern enabling IT, and for reducing redundant IT. Before the select phase can happen in the portfolio management process, an analysis phase must occur. The horizontal analysis is an essential perspective for reaping the benefits of the DoD EA. Not only does the horizontal analysis make it possible to improve the efficiency and effectiveness of DoD IT management, it also makes it possible to improve the efficiency and effectiveness of the enterprise by ensuring that IT is better aligned with the mission and strategic outcomes of the Department and resources are not wasted on redundant IT. Therefore, it is recommended that DoD NII Resource Management Directorate and the Architecture & Interoperability Directorate focus attention on the horizontal analysis and institutionalize it as a mechanism in the FY07 OSD IT 300 and 53, OMB A-11 implementing guidance.

It is also recommended that the DoD EA be institutionalized in guidance to provide the context for this analysis and as a mechanism for aggregating much complex architecture information in a fashion that is presentable to executives who are not interested in seeing the rigors of architecture analysis but are interested only in seeing the options and recommendations that comes from the analysis. The enterprise architecture rigor should be transparent to the executive and only showm if the executive wants to see it.

Another significant recommendation is the use of the DoD EA to institutionalize, in guidance, the use of the DoD EA to associate the DoD IT initiatives with the FEA and answer the architecture questions in the OMB Cir A-11 guidance about whether DoD's IT initiatives are associated with the agencies enterprise architecture and whether the IT is aligned with the FEA. By using the DoD EA,

DoD can answer yes to the first question and show how the IT alignment with the FEA is associated with DoD EA and DoD Architecture Framework artifacts.

Also it is recommended that the DoD EA value proposition be quantified, measured and tracked: The value proposition rests with the fact that the DoD EA:

- provides a common language to facilitate linkage of complex architectures
- provides a unifying organizational approach for complex architectural data
- better aligns architecture with the DoD mission areas of portfolio management
- lowers the cost of compliance with the OMB Circular A-11 requirements;
- supports the reduction of redundant IT
- improves the efficiency of the process for IT management
- provides EA information to inform the resource allocation process
- assists DoD Architects by promoting the sharing of a common taxonomy
- improves IT decisions by the mission area executives and managers
- uses enterprise architecture rigor to develop and support recommendations and options to facilitate executive decisions but keep it hidden from them and show it only if the executive wants to see it[19]

To realize this recommendation that the value proposition be quantified, measured and tracked:

- Performance metrics for measuring the value proposition must be established. Some possible measures include:
  - Using the DoD EA in the analysis step of the portfolio management process
  - Realizing improvements in EA scores from one year to next for DoD IT business cases
  - Converting the above value propositions into quantitative statements that are measurable
- Establish data collections mechanisms for collecting these data
- Collect and analyze the data and track improvements over time

[19] Considered a best practice at General Motors and Volkswagon of America